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NATIONAL STANDARDS COMMISSION

WEIGHTS & MEASURES (PATTERNS OF INSTRUMENTS) REGULATIONS

REGULATION 9

PROVISIONAL CERTIFICATE OF APPROVAL No P10/1/5

This is to certify that an approval has been granted by the Commission that the pattern and variant of the

Batchen Mk II LPG Driveway Flowmeter

submitted by D J Batchen Pty Ltd
6 Raglan Road
Auburn, New South Wales, 2114,

are suitable for use for trade.

The approval is subject to review on or after 1/8/83.

Instruments purporting to comply with this approval shall be marked NSC No P10/1/5.

Relevant drawings and specifications are lodged with the Commission.

Conditions of Approval

1. The initial verification of each driveway flowmeter shall be carried out under the supervision of a government-licensed LPG installer (where such exists) or a person experienced in the design and installation of LPG systems.

2. Instruments installed under this approval are to be tested at six-monthly intervals after the initial verification test. Such tests are to be arranged by the submittor and supervised by the State Weights and Measures Authority; the results are to be sent to the Commission.

3. The Commission reserves the right to inspect and test any installation covered by this approval at any time without notice.

4. In the event of unsatisfactory performance, this approval may be modified or cancelled.

Signed

Executive Director

Descriptive Advice

Pattern: approved 26/7/82

. Batchen Mk II attendant-operated driveway flowmeter for dispensing liquefied petroleum gas.

Technical Schedule No P10/1/5 dated 20/8/82 describes the pattern.

Variant: approved 22/7/83

1. With an electronic temperature compensator replacing the temperature compensator of the pattern and with or without an Epitronic MkI or MkII self-serve control console.

Technical Schedule No P10/1/5 Variation No 1 dated 10/8/83 describes variant 1.

Filing Advice

Certificate of Approval No P10/1/5 dated 20/8/82 is superseded by this Certificate and may be destroyed. Figures 3 and 4 dated 20/8/82 are replaced by the attached Figures 3 and 4.

The documentation for this approval now comprises:

Certificate of Approval No P10/1/5 dated 10/8/83
Technical Schedule No P10/1/5 dated 20/8/82
Technical Schedule No P10/1/5 Variation No 1 dated 10/8/83
Test Procedure No P10/1/5 dated 20/8/82
Test Procedure No P10/1/5 Variation No 1 dated 10/8/83
Figures 1 and 2, and 5 to 10 dated 20/8/82
Figure 3, 4 and 11 dated 10/8/83.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No P10/1/5

Pattern: Batchen Mk II LPG Driveway Flowmeter

Submittor: D J Batchen Pty Ltd,
6 Raglan Road,
Auburn, New South Wales, 2144.

1. Description of Pattern

The pattern is a Batchen Mk II driveway flowmeter (Figures 1 and 2) for the delivery of liquefied petroleum gas of density 0.500 to 0.515 kg/L at 15°C, at temperatures between 0°C and 45°C. The maximum and minimum flow rates are 80 L/min and 15 L/min respectively.

The hydraulic diagram for the driveway flowmeter is shown in Figure 3.

Volume	999.99 L in 0.01 L increments
Unit Price	99.9 c/L in 0.1c increments
Price	$999.99 in 1c increments
Totaliser Volume	99999 L in 1 L increments

1.1 Component Structure and Conditions for Installation*

The component parts of each driveway flowmeter are listed in Figure 4 and comprise those components listed in (iii) to (xi) below.

(i) Supply Tank

The supply tank is large enough to supply liquefied petroleum gas at a rate that does not cause the pressure in the supply tank to drop to the point where vapour production occurs in the line between the supply tank and the pump. The capacity of the supply tank is such that the maximum delivery of the driveway flowmeter in one minute is not greater than approximately 2.5% of the tank capacity.

The supply tank is located higher than the pump so that the liquid level always creates sufficient pressure at the pump inlet at maximum flow rate (that is, above the vapour pressure) to prevent vapour being formed.

(ii) Pump

The pump is positioned as close as possible to the supply tank, with short inlet connections, and having as few restrictions as possible. There shall be no restrictive fittings within ten pipe diameters of the pump inlet. The inlet pipe to the pump is larger than the outlet from the pump. The inlet line should, where possible, slope upwards towards the supply tank.

The external pump by-pass relief valve is installed in a line returning to the supply tank; this line should have no low spots which could trap liquid, and where possible should slope upwards towards the supply tank. The external by-pass setting is 100 to 140 kPa LOWER than the internal pump relief valve setting, where such a valve is fitted.

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* This approval relates to the metrological performance of the metering system; inspectors are advised that the system must comply with the requirements of other statutory authorities relating to safety, handling, storage and transportation of liquefied petroleum gas.

(iii) Meter

A Neptune Type 4D 32 mm liquefied petroleum gas meter. An internal by-pass allows a portion of the incoming liquid to pass to the temperature compensator without being included in the measurement.

(iv) Gas Purger

The meter is protected from the measurement of vapour by correct installation and by a Neptune 32 mm gas purger which incorporates an inlet non-return valve and internal hydrostatic relief valve, a strainer and a float chamber (Figure 5). The gas purger is vented through a non-return valve, via a vapour return line not less than 20 mm in diameter, to the vapour space in the supply tank. The vapour return line is constructed without low spots or traps which could prevent free flow of vapour in either direction.

A thermometer pocket is situated in the strainer cover (Figure 5).

(v) Temperature Compensator

A Neptune Type 1 Style 22 temperature compensator is attached to the top of the meter (Figures 6 and 7). Liquid flowing through the internal meter by-pass flows into the chamber between the temperature compensator and the meter, along the temperature-sensing capsule in the space between the capsule and a surrounding shield, and returns through a pipe to the bottom of the gas purger.

The expansion and contraction of the temperature-sensing capsule with changes in temperature of the liquid are transmitted by means of a pin-and-lever system to a variable-ratio drive which changes the coupling ratio between the meter and indicator so that the indicated volume is the equivalent volume at a temperature of 15°C. An adjustment screw fitted to the bottom of the lever permits calibration of the compensator.

A thermometer pocket is situated in the compensator cover (Figure 6).

(vi) Differential Valve

A Neptune 32 mm spring loaded diaphragm valve maintains pressure in the metering chamber to prevent the formation of vapour. A pressure-equalising pipe is connected from the differential valve through an excess-flow valve (which has no bleed hole) to the supply tank, through the vapour return line from the gas-purger vent (Figure 3). The differential valve is set at 100 kPa (i.e. 100 kPa above the vapour pressure).

(vii) Driveway Flowmeter Indicator

The flowmeter indicator is an Eclipse model MVR79S price-computing driveway-flowmeter indicator, driven via a shaft and gearbox by the Neptune meter temperature compensator output shaft. The unit price change and test buttons are located on the indicator housing.

The operating cycle is started by pressing the key switch. The display then blanks for one second, displays all "8's" for one second, and then all "0's", leaving only the unit price displayed. The remote pump then starts after which there is a ten second delay during which the dispensing nozzle cannot be withdrawn and no fuel is metered. A solenoid-operated latch is actuated at the end of the ten seconds, and the nozzle may be withdrawn and connected to the purchaser's tank. Replacement of the nozzle stops the remote pump but allows the displays to remain.

If the nozzle is not removed within 20 seconds, the system will shut down.

(viii) Vapour Indicator

A sight glass flow indicator is fitted in the outlet of the meter before the pressure differential valve, so that it may be seen whether vapour is being metered (Figure 3). A pressure gauge is fitted immediately downstream of the meter and before the sight glass.

(ix) Outlet Piping

The pipe connection from the differential valve to the hose is fitted with an internal safety control valve (ISC) incorporating an excess-flow valve. A bleed valve is provided to empty the hose before reconnecting the two parts of the hose break coupling, after rupture.

(x) Hose

The dispenser is fitted with a hose complying with the SAA code for hoses in use with liquefied petroleum gases, with a bore of either 12.5 mm or 20 mm. The hose is fitted with a hose break coupling which will break with a loss of no more than 15 mL of liquid if a vehicle drives away with the hose nozzle still attached.

(xi) Nozzle

The nozzle used is a REGO model A7197 (Figure 8).

(xii)

To facilitate pressure equalisation when the driveway flowmeter is being tested with a pressure prover, provision is made for a vapour line from the prover to the vapour space of the supply tank either directly or via a tee in the vapour return line from the gas-purger using a 1 3/4" Acme Male Adaptor. This provision is sealed OFF when not in use. During normal customer delivery there is no vapour return connection between the receiving container and the supply tank.

1.2 Marking

The instrument data plate permanently fixed to the external housing of the driveway flowmeter is marked with the following:

Manufacturer's name or mark	D J Batchen Pty Ltd
Year of manufacture	
Serial number	
NSC approval number	NSC No P10/1/5
Maximum flow rate	80 L/min
Minimum flow rate	15 L/min
Liquid temperature range	0°C to 45°C
Approved for LPG of density 0.500 to 0.515 kg/L only	
Density for which temperature compensator is set	..... kg/L
Maximum operating pressure	2450 kPa

1.3 Sealing

The computer is sealed with a single wire through each face, terminating in a lead seal as illustrated in Figure 9.

The meter, temperature compensator, meter drain valve and needle valve are sealed with a single wire terminating in a stamping plug as illustrated in Figure 10.

TEST PROCEDURE No P10/1/5

The following test procedure is to be used at each six-monthly reverification test. The tests are to be arranged so that one is carried out in the hotter period of each year and the other in the cooler period. One test should also be arranged when there is a low liquid level in the supply tank to ensure that there is still sufficient pressure at the inlet to the pump to avoid vapour being generated.

1. Visual Inspection

Visually inspect the complete installation to ensure that the pump, supply tank, dispenser and pipework are installed in accordance with the description given in Technical Schedule P10/1/5. If the system is not installed correctly (for example, if a restrictive valve or fitting is installed in the pipeline) vapour may be generated and will show in the sight glass, when the purger does not eliminate all the vapour.

2. Meter Test With Temperature Compensator De-activated

Tolerance ±0.5% at normal flow rate
±1.0% at minimum flow rate

(i) Carry out at least three runs into the prover at the normal flow rate at which the meter is used. Read the temperature and pressure at the meter and at the prover. Correct for the changes in volume of the liquid due to any difference in pressure and temperature between the meter and the prover, and for changes in the volume of the prover due to any difference in pressure and temperature from the reference temperature and pressure at which it was calibrated.

(ii) Repeat the above test at the minimum flow rate of the meter or 15 L/min, whichever is the greatest.

(iii) During the test runs, note whether any vapour is showing in the sight glass.

3. Meter Test With Temperature Compensator Activated

Tolerance ±(0.7% + 0.02% per °C difference from 15°C) at normal flow rate
±(1.2% + 0.02% per °C difference from 15°C) at minimum flow rate.

(i) Carry out at least three runs into the prover at the normal flow rate. Read the temperature and pressure at the meter and the prover. After correcting the prover volume reading to its calibration temperature and pressure, reduce the volume to its equivalent volume at 15°C using the temperature indicated at the meter and the appropriate table for the density of the liquid for which the meter temperature compensator is set.* Compare the calibrated volume with the meter indicated volume.

(ii) Repeat the above test at the minimum flow rate of the meter or 15 L/min, whichever is the greater.

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*ASTM-IP Petroleum Measurement Table 54 - Volume Reduction to 15°C (Metric Edition).

4. Price-computation

(i) Note the unit price set on the driveway flowmeter. Wait at least 15 seconds after termination of the last sale, then press and release the TEST button on the Eclipse indicator. The computer will then display TEST on all displays, and the dispensing nozzle release solenoid will actuate. (Note that in TEST mode the nozzle release solenoid is activated at all times).

(ii) Remove the dispensing nozzle from its receptacle.

(iii) Set the unit price to 30 cents per litre (The price may be changed by simultaneously pressing the PRICE and the UP or DOWN buttons).

(iv) Replace the dispensing nozzle in its receptacle.

(v) Press the key switch. The computer will then enter a reset cycle followed by a simulated fuel delivery mode.

(vi) Press the FAST or SLOW button to display a volume between 7.49 and 7.54 litres. The price will be $2.25 for 7.49, 7.50 and 7.51 litres, or $2.26 for 7.52, 7.53 or 7.54 litres.

(vii) Remove the dispensing nozzle from its receptacle and wait three seconds. Repeat sequences from step (iv) if further simulated sales are to be performed. Alternatively, change the unit price to 30.9 cents per litre, when "ERROR 2" will flash indicating a multiplication error.

(viii) Change the unit price back to the original value noted in (i).

(ix) Press TEST button once to abandon TEST mode.

(x) Replace the dispensing nozzle in its receptacle.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No P10/1/5

Variation No 1

Pattern: Batchen Mk II LPG Driveway Flowmeter

Submittor: D J Batchen Pty Ltd
6 Raglan Road
Auburn, New South Wales, 2144.

1. Description of Variant 1

With the temperature compensator of the pattern replaced by an electronic temperature compensator incorporated in the Eclipse MVR79S computer. The instrument (Figure 11) is as described for the pattern in Technical Schedule No P10/1/5, except as detailed below.

This instrument may be used with or without an Epitronic MkI or MkII self-serve console (NSC approval No 5/6A/70).

1.1 Meter

Without the internal by-pass.

1.2 Electronic Temperature Compensator

Temperature compensation is achieved by means of an electronic compensator built in to the Eclipse MVR79S.

The probe for the compensator is located in the stream of liquid close to the meter's inlet. The electronic probe circuitry senses changes of temperature in the liquid, and the MVR79S adjusts the indicated volume to the equivalent volume at a temperature of 15°C. A switch is provided to de-activate the temperature compensating function for testing purposes.

Fifteen seconds after a sale has been terminated and with the nozzle held in its receptacle, pressing the TOTALS (or TOTES) button in the middle of the indicator will display the following:-

Cumulative Dollars Sold in whole Dollars
Cumulative Volume Sold in whole Litres
Temperature display.

On release of the button the display will revert to the previous sale information.

The temperature display is an indirect display of the liquid temperature. This display can be converted into degrees celsius by the following:

$$\frac{\text{Temperature Display} - 20}{2} = \text{Liquid Temperature in °C}$$

Note: When the electronic temperature compensator is de-activated the temperature display will show 50.

1.3 Indicator

An Eclipse model MVR79S driveway flowmeter indicator, similar to that in the pattern, is driven from the output shaft of the meter (Figure 11).

When modified to suit connection to an Epitronic MkI or MkII self-serve console, the operating cycle detailed in Technical Schedule P10/1/5 paragraph 1.1(vii) is altered only in that operating the key switch signals the console for authorisation, after which the cycle is as described.

1.4 Sealing/Verification

A stamping plug is provided for verification purposes (Figure 11). The mechanical calibrator is sealed by lead and wire.

TEST PROCEDURE No P10/1/5

VARIATION No 1

These tests should be conducted in addition to the tests in Test Procedure No P10/1/5 dated 20/8/82.

Note: In order to allow the service station to continue to function while these tests are carried out, a number of the driveway flowmeters may be isolated by switching to ATTENDED (MANUAL) mode at the flowmeter while the remainder are left in CONSOLE mode.

(i) Ensure that CONSOLE mode is selected at those driveway flowmeters to be tested.

(ii) At the control console select CONSOLE (POST-PAY) mode of operation by use of the keyswitch.

(iii) In turn, press each STATUS button and check that all 8's are displayed.

For one driveway flowmeter (or more if thought to be necessary):

(iv) Operate the keyswitch and release - the AUTHORISATION light should flash at the console; authorise the driveway flowmeter by pressing AUTHORISATION button for that flowmeter.

(v) Deliver sufficient liquid to cause the price and quantity indicators on the driveway flowmeter to move significantly off zero.

(vi) Stop the pump motor by returning the nozzle to its receptacle.

(vii) Record the driveway flowmeter number and the price indicated on the driveway flowmeter.

(viii) Operate the keyswitch and release, and check that the price-computing indicator does not reset to zero and that the pump motor does not start (AUTHORISATION and STATUS lights will be illuminated).

(ix) At the control console press the STATUS button for the driveway flowmeter and check the display price against the price recorded at the driveway flowmeter - refer (vii).

(x) Authorise the driveway flowmeter by pressing the AUTHORISATION button.

(xi) After a minimum of 20 seconds the STATUS light for that flowmeter will flash. Press the STATUS button; the price and volume indicators, on both the console and the driveway flowmeter, should zero.

FIGURE P10/1/5 - 4

Note: This Table replaces the Table (Figure 4) dated 20/8/82.

		Mech. Temp. Compensator	Elec. Temp. Compensator	Elec. Temp. Compensator-Self-serve
Meter	Neptune type 4D 32 mm complete with gas purger, type 1 style 22 temperature compensator and differential valve	*		
	Neptune type 4D 32 mm complete with gas purger and differential valve		*	*
Computer	Eclipse MVR79S	*		
	Eclipse MVR79S with electronic temperature compensator		*	
	Eclipse MVR79S with electronic temperature compensator capable of communicating with an Epitronic Mk I or Mk II console			*
Sight Glass	Clam 40 mm steel flow indicator or fabricated steel flow indicator	*	*	*
Delivery Hose	Hose of 12.5 or 20 mm bore approved for LPG	*	*	*
Nozzle	Rego A7197	*	*	*
Hydrostatic Relief Valve	6 mm - ¼" NPT thread Rego 3127U or Fisher H124	*	*	*
Isolating Valves (Liquid)	Fisher internal safety control (ISC) valve incorporating excess flow valve	*	*	*
(Vapour)	Rego angle globe valve incorporating excess flow valve	*	*	*

Components Parts Table

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No P10/1/5

CHANGE No 1

The following changes are made to the approval documentation for the

Batchen Mk II LPG Driveway Flowmeter

submitted by D J Batchen Pty Ltd
6 Raglan Road
Auburn New South Wales 2114.

1. In Technical Schedule No P10/1/5 dated 20/8/82, add the following to paragraph 1.1 (iii) Meter;

"A backcheck valve may be fitted in the pipe between the meter and the differential valve."

2. The attached Figure 3 dated 10/8/83 should be added to the documentation for this approval.

Note: This Figure was inadvertently omitted from the documentation issued with Variation No 1 dated 10/8/83.

Signed

Executive Director

23/12/83

J B.

P10/1/5
8/7/86

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

PROVISIONAL CERTIFICATE OF APPROVAL No P10/1/5

CHANGE No 2

The following changes are made to the approval documentation for the

Batchen MkII LPG Driveway Flowmeter

submitted by D J Batchen Pty Ltd
6 Raglan Road
Auburn NSW 2144.

In Test Procedure No P10/1/5 dated 20/8/82:

a) Delete references to Tolerances from clauses 2 and 3.

b) Insert the following before clause 1;

The maximum permissible error applied during a verification test from normal flow rate to the minimum flow rate * specified in the Technical Schedule is:

± 1.0% with the temperature compensator deactivated

and ± (1.2% + 0.02% per °C difference from 15°C) with the temperature compensator activated.

* The minimum flow rate for driveway flowmeters is 15 L/min unless otherwise specified in the Technical Schedule.

Signed

Executive Director

National Standards Commission

NOTIFICATION OF CHANGE

VARIOUS CERTIFICATES OF APPROVAL

The following changes are made to the approval documentation for various LPG flowmeter approvals as listed below:

In the approvals listed below, remove from the Certificate, Technical Schedule and Test Procedure, any Condition of Approval or clause that refers to instruments being verified, re-verified or calibrated at specific intervals. (Note that the re-verification period is determined by the Trade Measurement Authority in the State or Territory in which the instrument is located.)

APPROVAL NUMBER	PATTERN
10/1/2	Halco Neptune 32/38 mm LPG Flowmeter
P10/1/3	Acme Model LGD 100 LPG Driveway Flowmeter
10/1/3A	Acme Model LGD 105S LPG Driveway Flowmeter
P10/1/5	Batchen Model Mk II LPG Driveway Flowmeter
P10/1/6	Wayne Model ELC1 LPG Driveway Flowmeter
10/1/6A	Email Model ELC1 LPG Driveway Flowmeter
P10/1/7	Indeng Model MKO LPG Driveway Flowmeter
10/1/8	Gilbarco Model T093D LPG Driveway Flowmeter
10/1/8A	Gilbarco Model T093D LPG Driveway Flowmeter
10/1/9	Batchen Model Commander LPG Driveway Flowmeter
P10/1/10	LPG Engineering Model Stargas LPG Driveway Flowmeter
10/1/10A	LPG Engineering Model Stargas LPG Driveway Flowmeter
10/1/11	LPG Engineering Model Stargas EPSN LPG Driveway Flowmeter
10/1/12	CleverHead Model 93 LPG Driveway Flowmeter
10/1/13	Batchen Model SCB Commander LPG Driveway Flowmeter
P10/2/2	Liquid Controls Model MA-7-GY-10 Bulk LPG Flowmeter
10/2/3	Neptune Model 4D 32 mm Bulk LPG Flowmeter
P10/2/4	Euromatic Model FL 11/2-125 Turbine Bulk LPG Flowmeter

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Measuring Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.

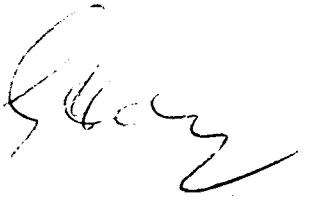
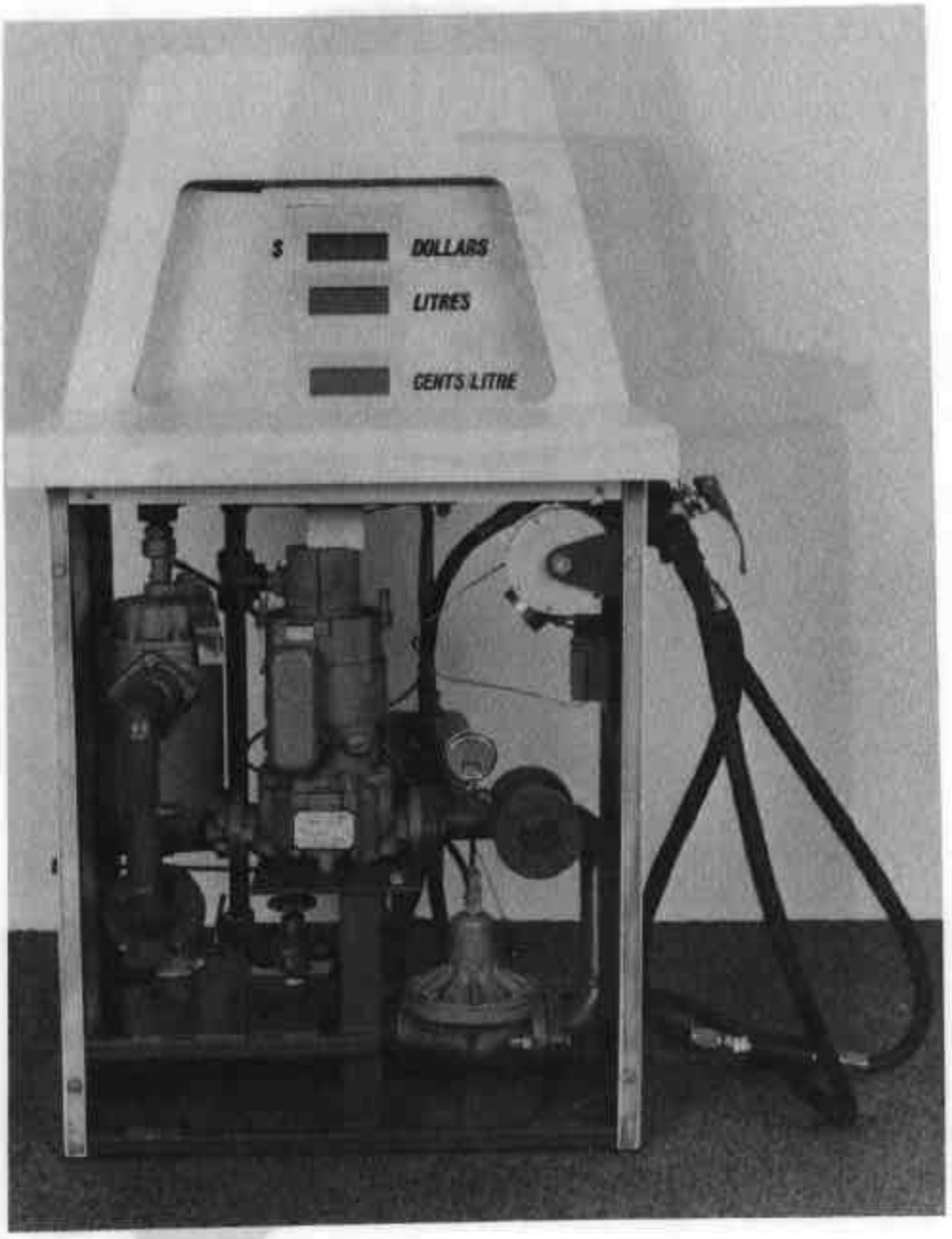


FIGURE P10/1/5 - 1

Batchen Mk II LPG Driveway Flowmeter

20/8/82

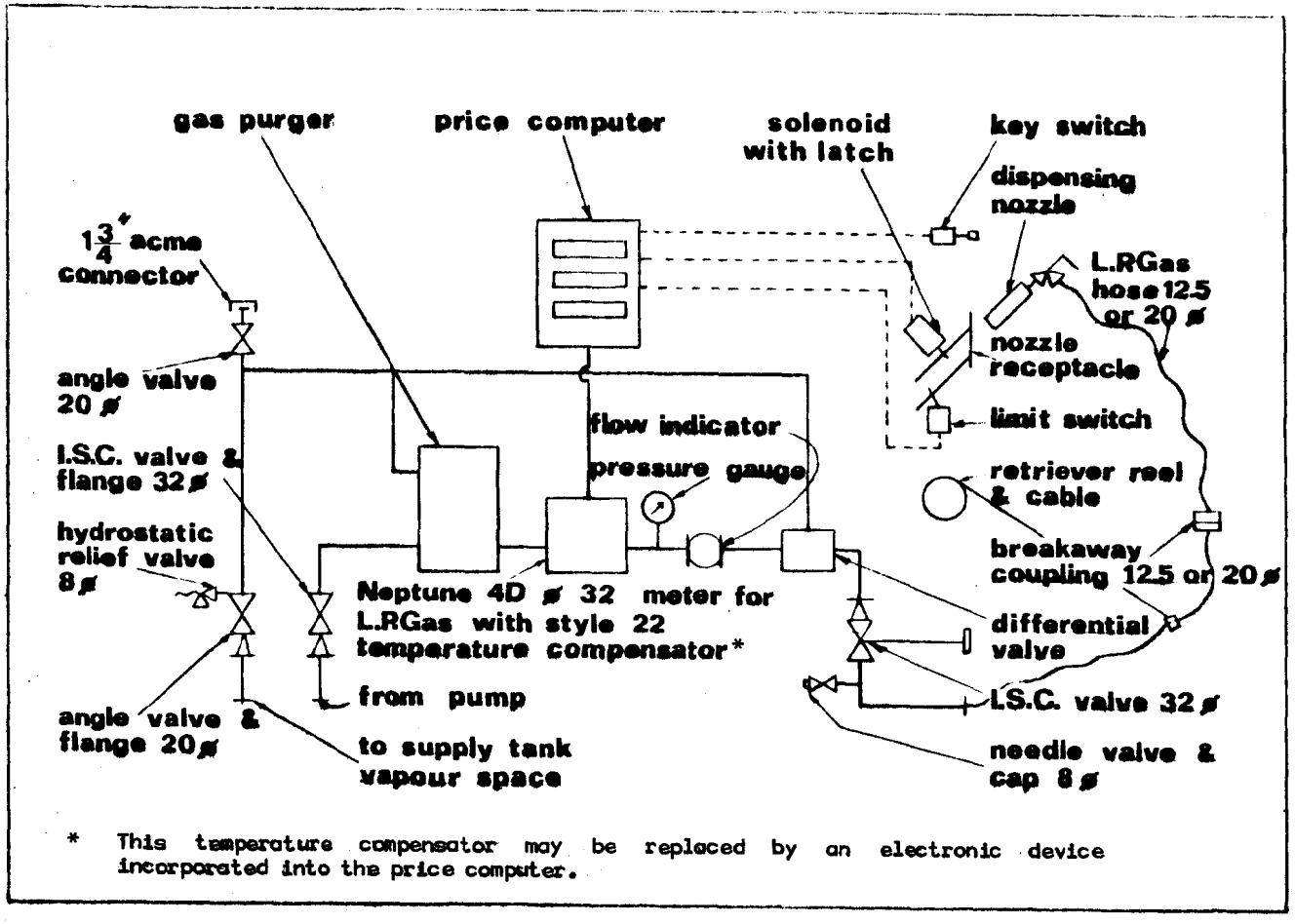
FIGURE P10/1/5 - 2



Batchen Mk II LPG DFM With Covers Removed

20/8/82

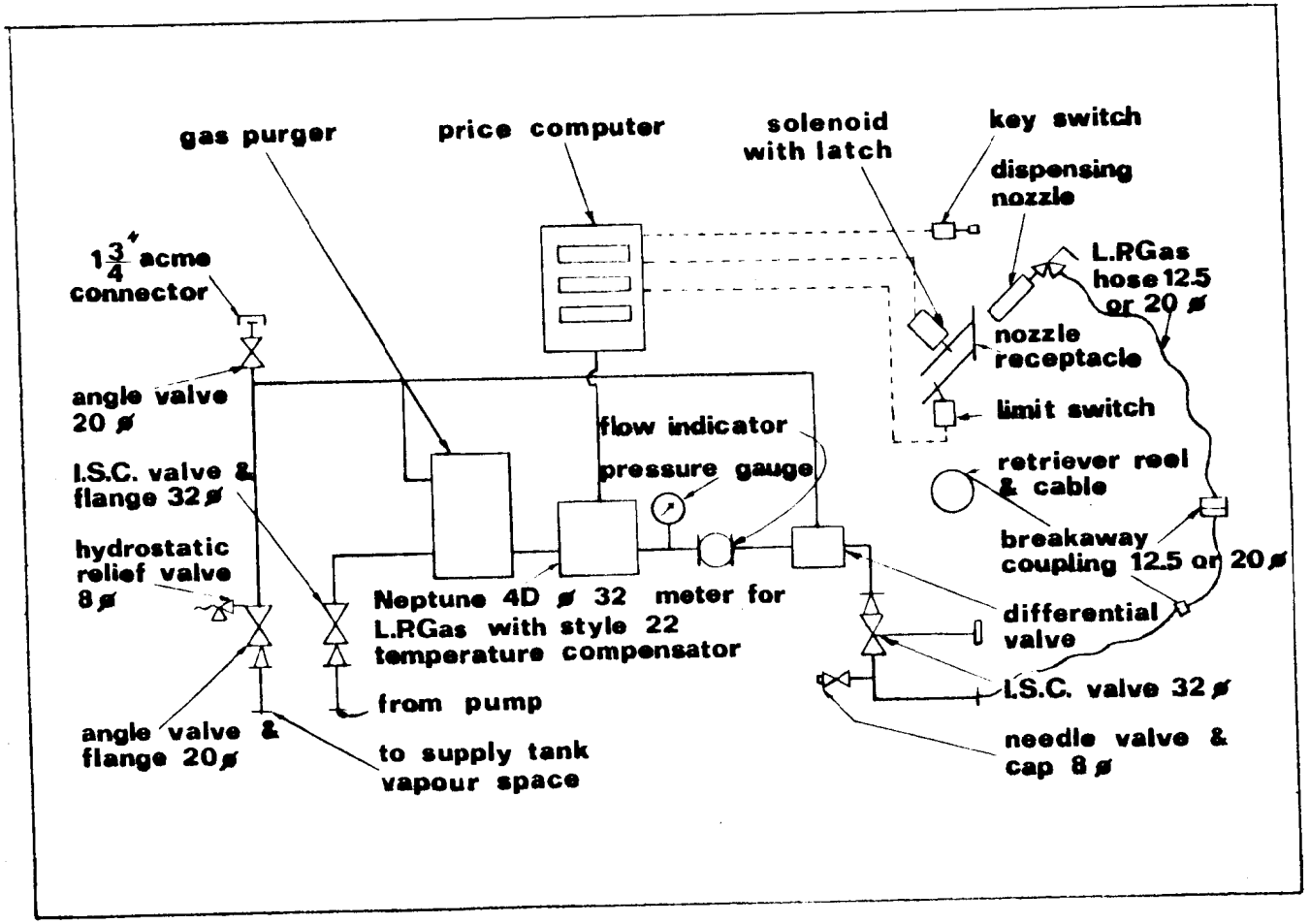
FIGURE P10/1/5 - 3



* This temperature compensator may be replaced by an electronic device incorporated into the price computer.

Batchen Mk II - Hydraulic Diagram

FIGURE P10/1/5 - 3

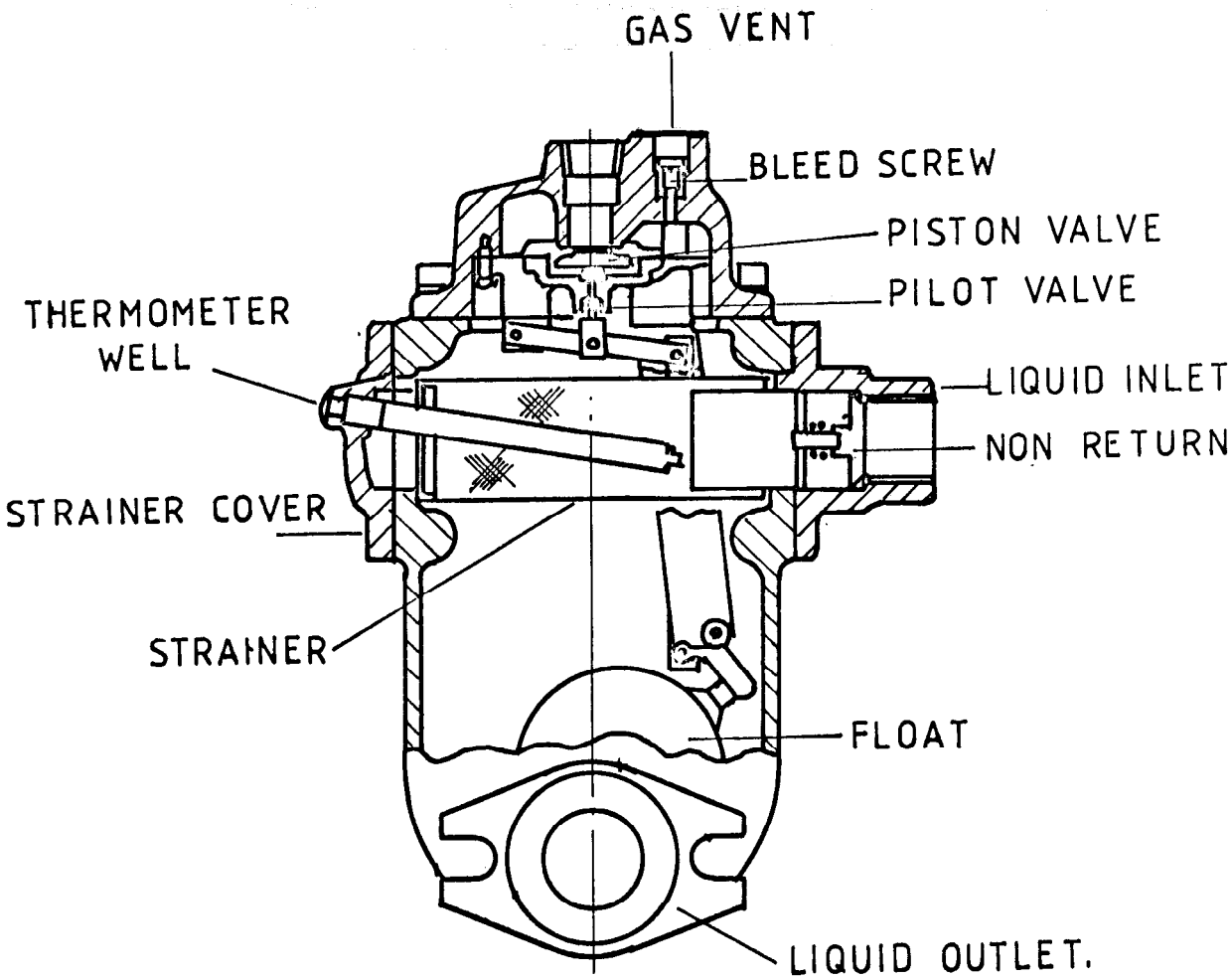


Batchen Mk II - Hydraulic Diagram

Meter:		Neptune Type 4D 32 mm complete with gas purger, Type 1 Style 22 temperature compensator, and differential valve.
Computer:		Eclipse model MVR79S driveway flowmeter indicator.
Sight Glass:		Clam 40 mm steel flow indicator or fabricated steel flow indicator.
Delivery Hose:		Standard commercial hose approved for LPG, 12.5 mm or 20 mm.
Nozzle:		Rego A7197
Hydrostatic Relief Valve:		8 mm - ¼" N.P.T. thread, Rego 3127U or Fisher H124.
Isolating Valves:	(Liquid)	Fisher Internal Safety Control (ISC) valve incorporating excess flow valve.
	(Vapour)	Rego angle globe valve incorporating excess flow valve, 20 mm.

Component Table For Batchen Mk II LPG Driveway Flowmeter

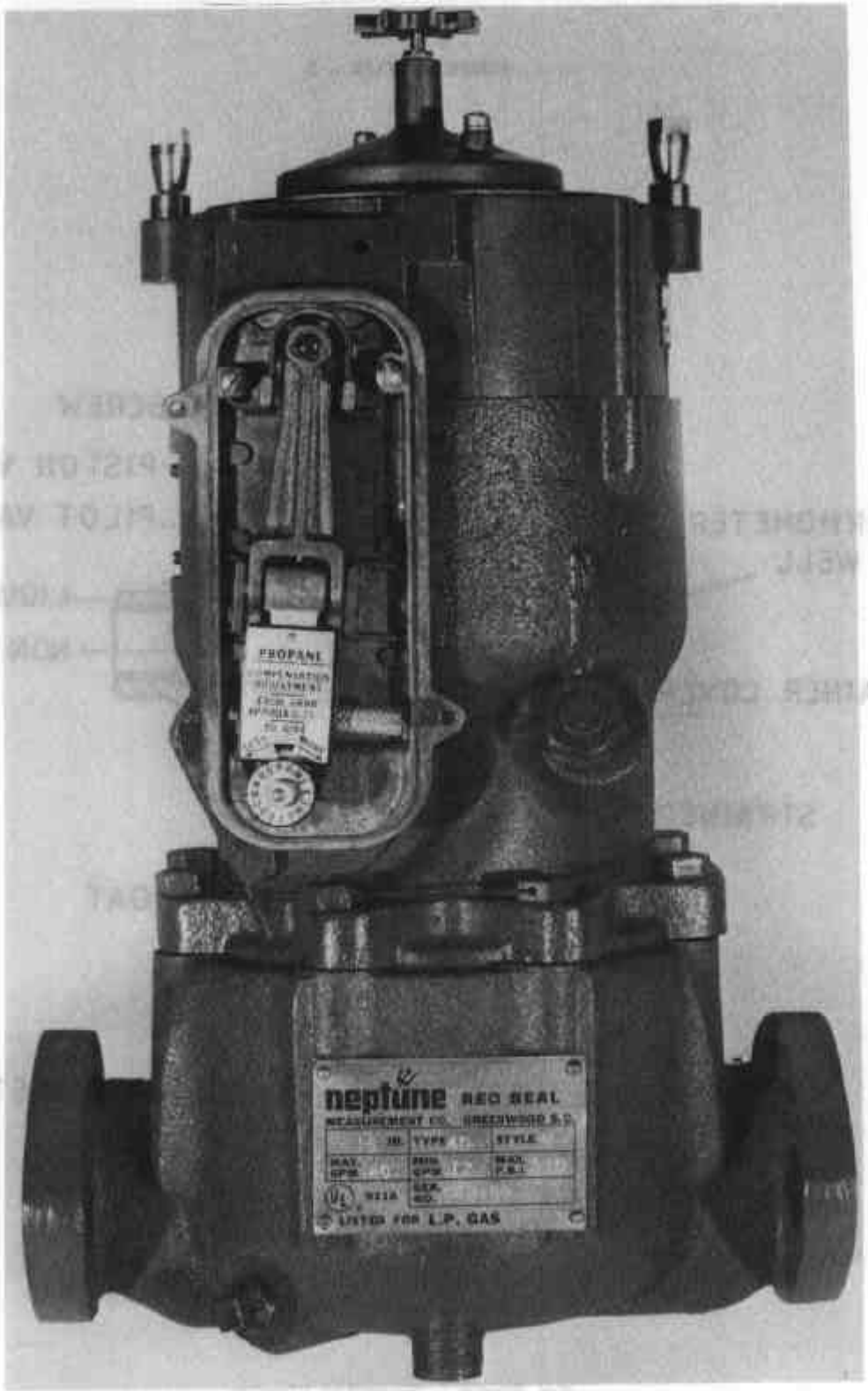
FIGURE P10/1/5 - 5



Gas Purger - Schematic Diagram

20/8/82

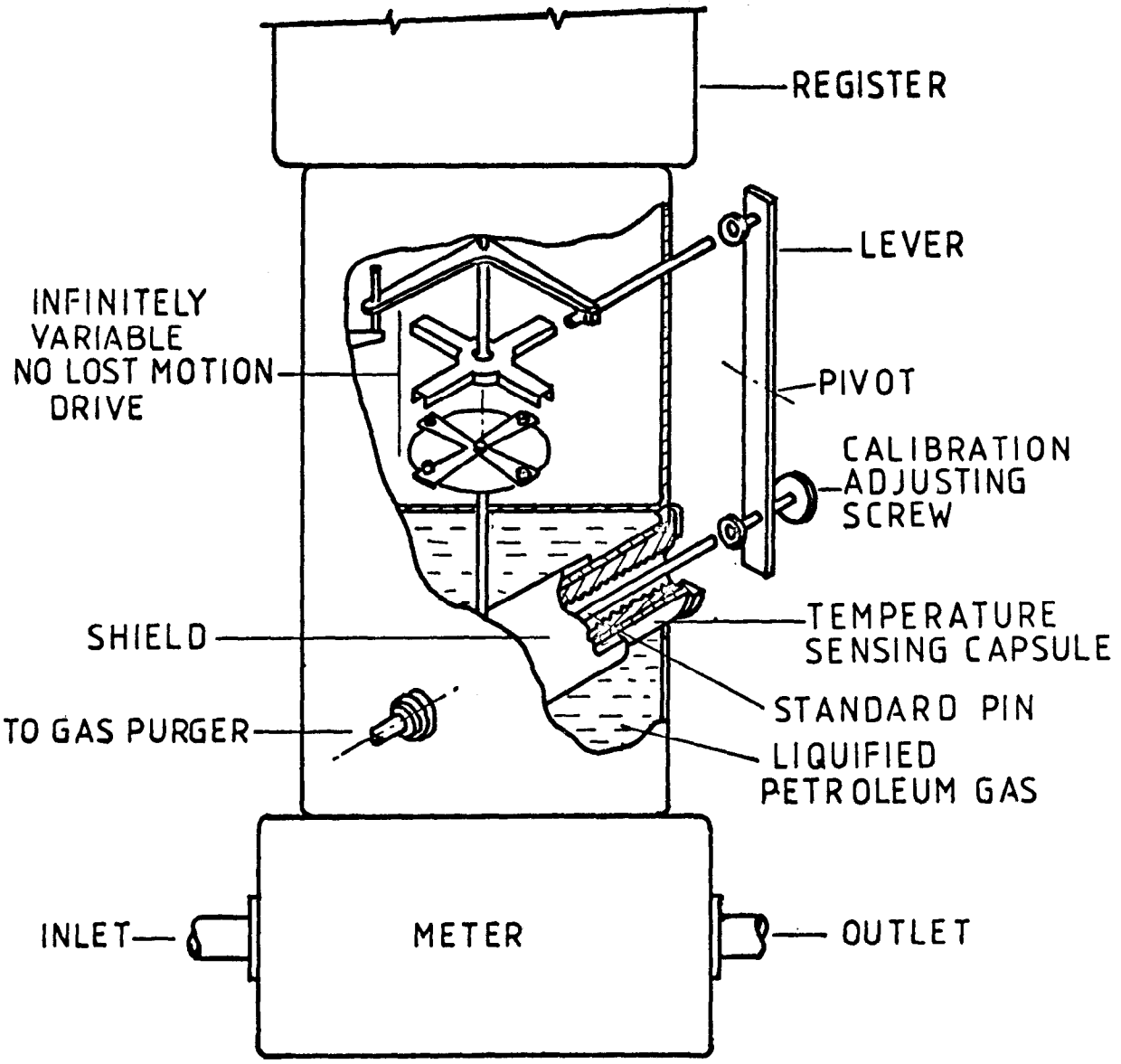
FIGURE P10/1/5 - 6



Temperature Compensator With Cover Of Calibration Adjuster Removed

20/8/82

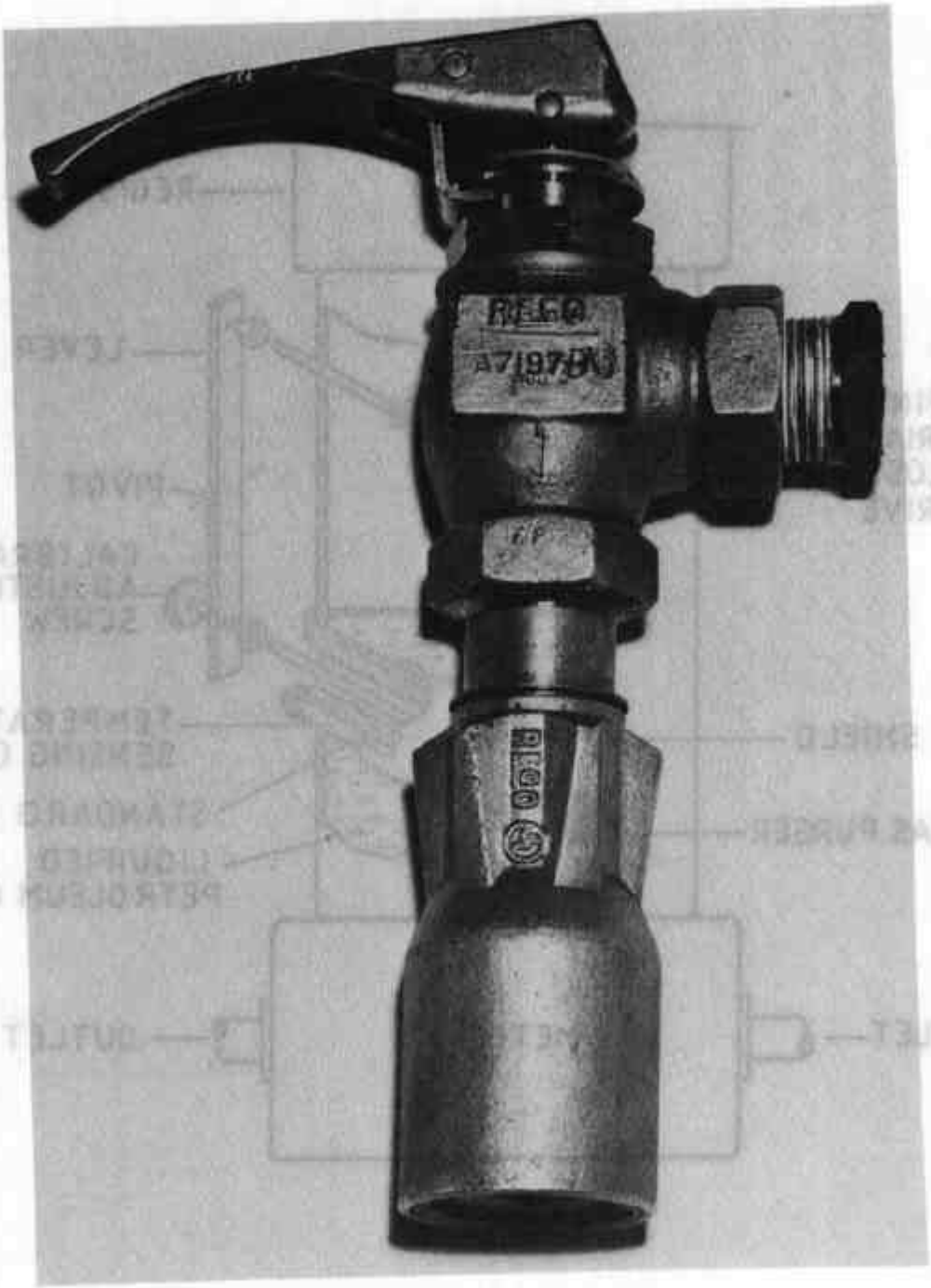
FIGURE P10/1/5 - 7



Temperature Compensator - Schematic Diagram

20/8/82

FIGURE P10/1/5 - 8



Rego Nozzle Model A7197

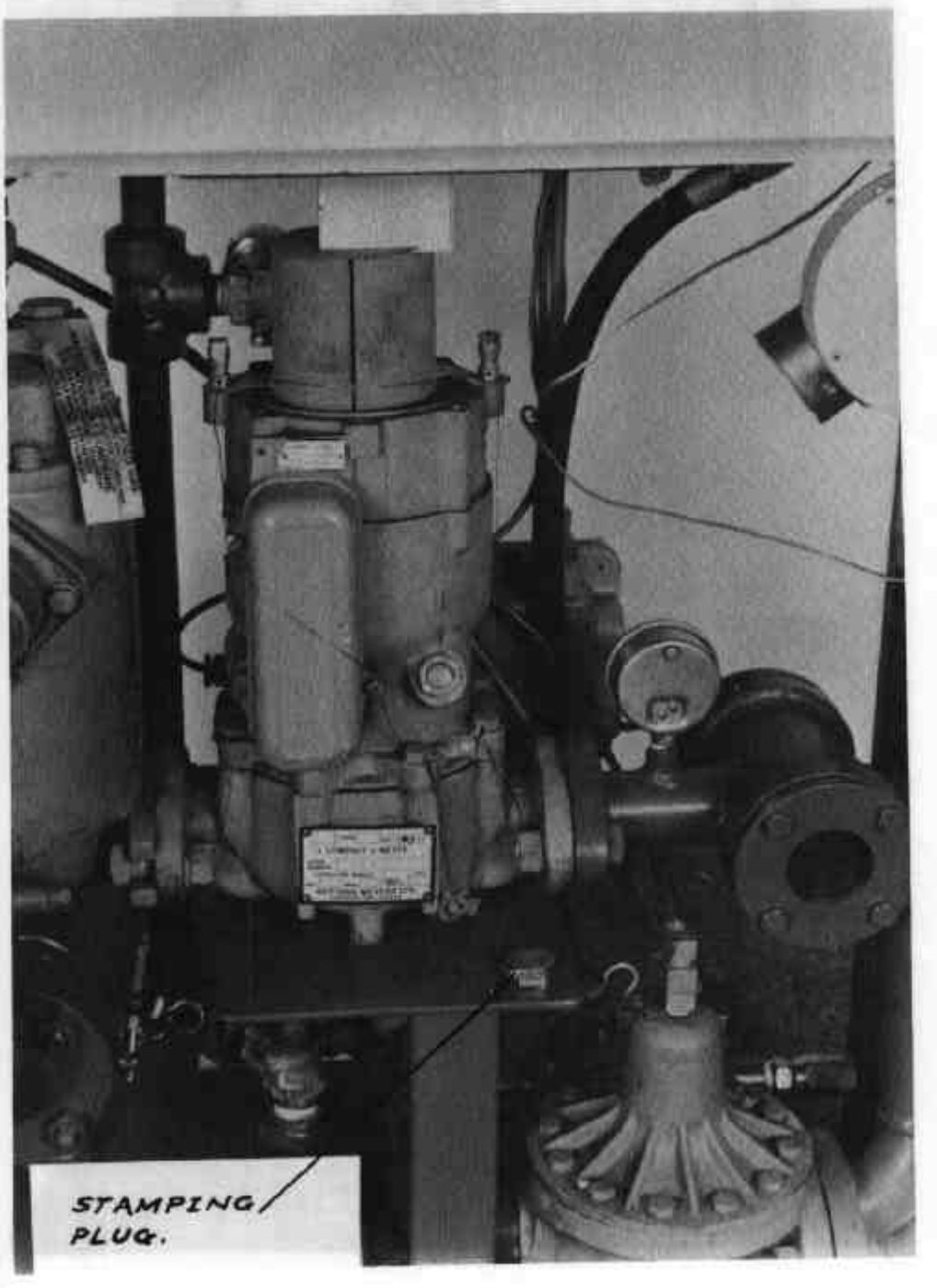
20/8/82

FIGURE P10/1/5 - 9

Sealing Of Eclipse MVR79S Computer

20/8/82

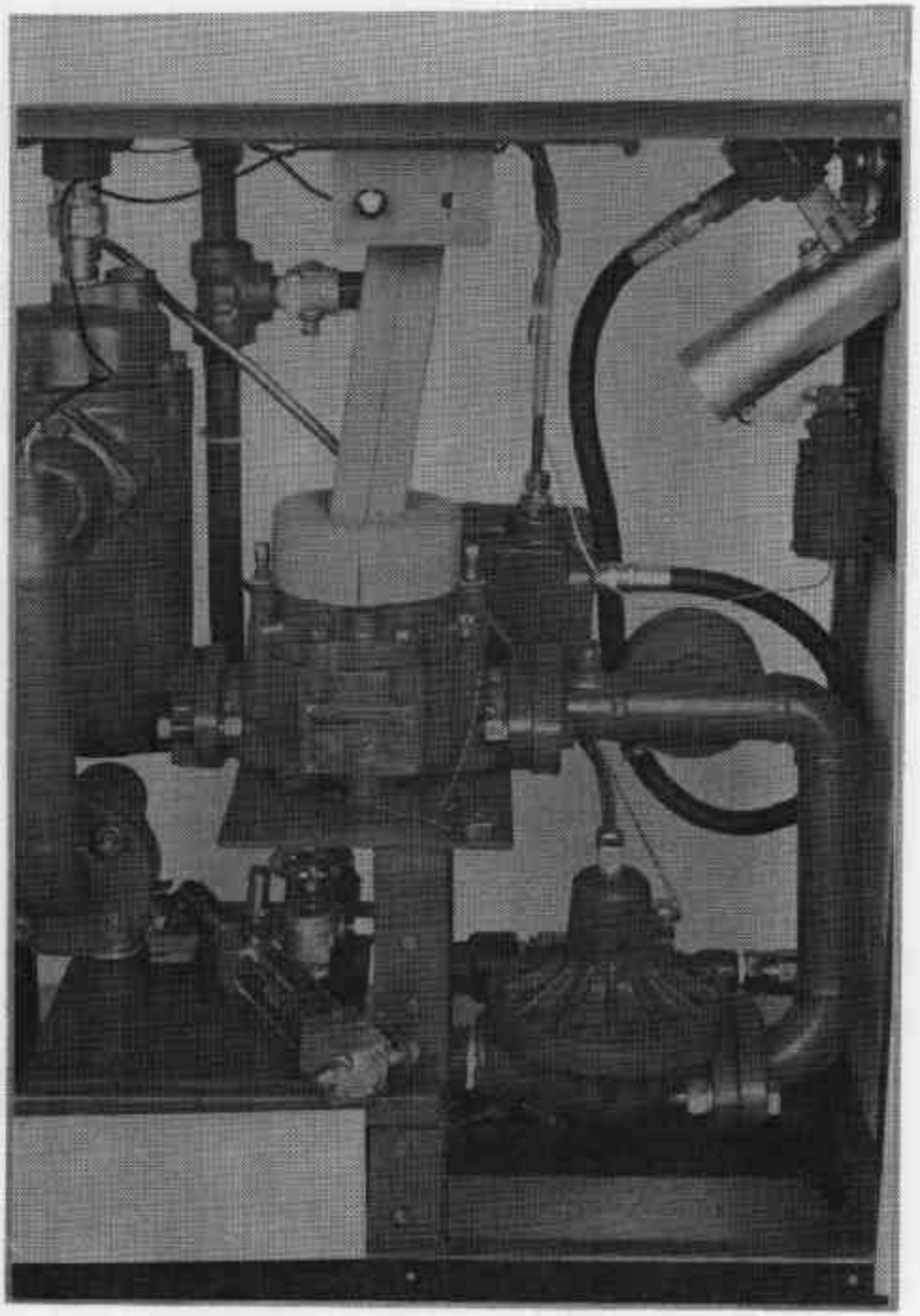
FIGURE P10/1/5 - 10



Sealing Of Meter, Temperature Compensator, etc.

20/8/82

FIGURE P10/1/5 - 11



Batchen MkII LPG DFM With Electronic
Temperature Compensation

10/8/83